

Application Number: 10/556,650
Amendment Dated: February 25, 2009
Reply to Office Action Dated: September 25, 2008

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LISTING OF THE CLAIMS

1. (currently amended) A gas detector comprising:
a first electrically conductive material layer;
an electrically nonconductive material layer disposed on the first electrically conductive material layer;
a second electrically conductive material layer disposed on the electrically nonconductive material layer;
a gas source in fluid communication with the second electrically conductive material layer; and
a power source in electrical communication with the first and second electrically conductive material layers,
wherein the first electrically conductive material layer is formed from an electrically conductive material that is non-catalytic for the gas to be detected, and wherein the second electrically conductive material layer is formed from an electrically conductive material is selectively catalytic for the gas to be detected.
2. (original) The gas detector according to claim 1, wherein the first electrically conductive material layer contains a metal selected from the group consisting of aluminum, magnesium, chromium, titanium and zirconium.
3. (original) The gas detector according to claim 1, wherein the second electrically conductive material layer contains a metal selected from the group consisting of silver, gold, platinum, rhodium, iridium, palladium, ruthenium, and osmium.
4. (original) The gas detector according to claim 3, wherein the second electrically conductive material layer contains gold.

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5. (original) The gas detector according to claim 1, wherein the electrically nonconductive material layer contains at least one compound selected from the group consisting of aluminum oxide, magnesium oxide, chromic oxide, titanium dioxide, zirconium oxide, and silicon dioxide.

6. (original) The gas detector according to claim 1, wherein the gas detector is capable of detecting sulfur dioxide.

7. (original) The gas detector according to claim 1, wherein the power source is a direct current power source.

8. (original) The gas detector according to claim 1, wherein the power source is an alternating current power source.

9. (currently amended) A method of determining the presence of a gas, the method comprising determining the change in impedance of a tunnel junction device upon exposure to a gas sample, wherein the tunnel junction device contains comprises:

a first electrically conductive material layer,

an electrically nonconductive material layer disposed on the first electrically conductive material layer, and

a second electrically conductive material layer disposed on the electrically nonconductive material layer, and

wherein the first and second electrically conducting layers are in electrical communication with a power source, wherein the first electrically conductive material layer is formed from an electrically conductive material that is non-catalytic for the gas to be detected, and wherein the second electrically conductive material layer is formed from an electrically conductive material is selectively catalytic for the gas to be detected.

Application Number 10/656,650
PAGE 6/6 * RCVD AT 2/25/2009 11:56:32 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-4/15 * DNI:2738300 * CSID:4409377839 * DURATION (mm:ss):06-12

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